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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,988	12/03/2003	James W. Blatchford	TI-36487 (032350.B542)	5047

7590 01/05/2005
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EXAMINER

NGUYEN, HUNG

ART UNIT PAPER NUMBER

2851

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/726,988

Applicant(s)

BLATCHFORD, JAMES W.

Examiner

Hung Henry V Nguyen

Art Unit

2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 December 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-20 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/03.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 8-9, 11-14, 18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Palmer et al (U.S.Pat. 5,442,184).

With respect to claims 1, 11, and 20, Palmer et al discloses a system and corresponding method for custom-polarized photolithography illumination system comprising all basic features of the instant claim such as: an illuminator (18) operable to produce an illumination patterned of light; a polarizer unit (30) operable to variably polarized the light and a mask pattern (24) defining photolithographic pattern features in two dimensions (X and Y directions), the mask pattern associated with a mask (20) capable of transmitting at least a portion of the variably polarized light through the mask pattern (see figure 1).

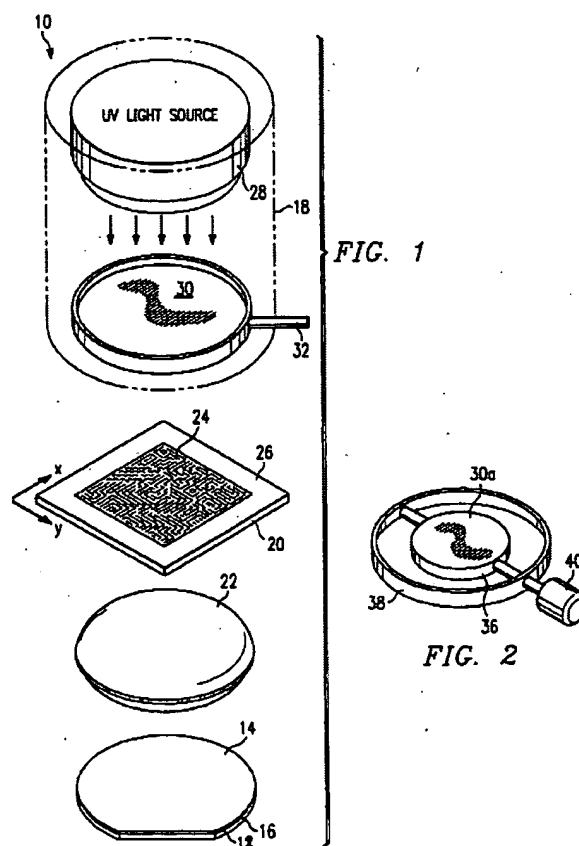
As to claims 2-3, and 12-13 Palmer teaches the polarizer unit (30) having one or more polarization rotators (32) capable of receiving the light from the illuminator and rotating the polarization of a portion of light to generate tangentially polarized light (see col.2, lines 60 thru col.3, lines 1-16).

Regarding claims 4, and 14 Palmer teaches at least one polarization rotator comprises a half wave plate (see col.3, line 11-12).

Art Unit: 2851

As to claim 8, Palmer further teaches that illuminator includes a light source (28); a polarizer (30) capable of linearly polarizing the light (see col.3, line 10) and a prism system/a dichroic filter (see col.3, line 11) capable of forming the illumination pattern.

As to claims 9, and 18, Palmer discloses a lens system (22) operable to receive and direct the transmitted light; a wafer (16), wherein at least a portion of the wafer is covered in a photosensitive material (12) capable of forming the photosensitive pattern on the wafer when the material is exposed to at least a portion of the variably polarized light, the pattern specific to the variable polarized light (see col.2, lines 36-47) and a medium/air disposed between the lens system and the wafer (see figure 1).



Figures 1 and 2 of Palmer et al.

Art Unit: 2851

3. Claims 1-3, 5-9, and 11-13, 15-18 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Schuster et al (US 2001/0019404).

With respect to claims 1, 11, and 20, Schuster et al discloses a system and corresponding method for custom-polarized photolithography illumination system comprising all basic features of the instant claim such as: an illuminator (1, 21) operable to produce an illumination patterned of light; a polarizer unit (6, 6') operable to variably polarized the light and a mask pattern defining photolithographic pattern features in two dimensions (X and Y directions), the mask pattern associated with a mask (3) capable of transmitting at least a portion of the variably polarized light through the mask pattern .

As to claims 2-3, and 12-13, Schuster teaches the polarizer unit (6, 6') having one or more polarization rotators (6') capable of receiving the light from the illuminator and rotating the polarization of a portion of light to generate tangentially polarized light (see figure 3)

With respect to claims 5-7, and 15-17, Schuster further teaches the illumination system having a dipole illumination pattern having two symmetrically opposed light beams, or a quadruple illumination pattern with a first and second set symmetrically opposed light beam or an annular illumination pattern with a plurality of sets of symmetrically opposed light beam portions. (see section [0030])

As to claim 8, Schuster et al further teaches that illuminator includes a light source (1); a polarizer (6) capable of linearly polarizing the light and a prism system/an axicon (22) capable of forming the illumination pattern.

As to claims 9, and 18, Schuster et al discloses a lens system (41-46) operable to receive and direct the transmitted light; a wafer (5), wherein at least a portion of the wafer is covered in a

Art Unit: 2851

photosensitive material capable of forming the photosensitive pattern on the wafer when the material is exposed to at least a portion of the variably polarized light, the pattern specific to the variable polarized light and a medium/air disposed between the lens system and the wafer (see figure 1).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 5-7, 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmer et al (U.S.Pat. 5,442,184) in view of Schuster et al (U.S.Pat. US 2001/0019404 A1).

With respect to claims 5-7 and 15-17, Palmer et al discloses a system and corresponding method for custom-polarized photography illumination comprising substantially all of the limitations of the instant claim as discussed above. Palmer does not expressly disclose the illumination system having a dipole illumination pattern or a quadruple illumination pattern, or annular illumination pattern as recited in the instant claims. However, these illumination patterns are well known per se for use in tangential polarization. For example, Schuster teaches a micro lithographic projection system which is provided with the dipole illumination/or annular illumination or quadruple illumination (see section [0030] for example). In view of such teachings it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Palmer and Schuster to obtain the invention as

Art Unit: 2851

specified in the above claims. It would have been obvious to employ the dipole/or annular/or quadruple illumination pattern as suggested by Schuster into the system of Palmer for at least the purpose of obtaining high numerical aperture and polarization and whereby the resolution of the images to be printed is greatly improved.

6. Claims 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palmer et al (U.S.Pat. 5,442,184) in view of Sewell (U.S.Pat. 6,809,794).

As to claims 10 and 19, Palmer et al discloses substantially all of the structures set forth in the instant claims except for the medium being liquid. It is the Examiner's position that employing a liquid medium between the wafer/substrate and projection optical system in a lithography system is well known in the art. For example, Sewell discloses a photolithography system where a liquid is provided between the projection optical system and the substrate (see abstract) to change the refractive index thereby enabling enhanced resolution with a lower effective wavelength of the light source (see col.1, lines 42-50). It would have been obvious to a skilled artisan at the time the invention was made to utilize a liquid between the lens system and the wafer in the system of Palmer et al for the purpose of improving the quality of the images.

Prior Art Made of Record

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schiifer (U.S.Pat. 4,755,027) discloses an optical arrangements for the generation of tangentially polarized light ;

Art Unit: 2851

Schuster (U.S.Pat. 6,392,800); Muller Rissmann et al (U.S.Pat. 6,522,392) discloses optical system for producing a polarized beam of light, each of which comprises substantially all elements as recited in the claims of the present invention.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 571-272-2124. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Nguyen can be reached on 571-272-2258. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hung Henry V Nguyen
Primary Examiner
Art Unit 2851

hvn
12/31/04